

# Sewage Handling

## Environmental Concerns

Raw or poorly treated sewage from boaters is harmful to human health. Typhoid, hepatitis, cholera, gastroenteritis, and other waterborne diseases may be passed directly to people who swim in contaminated waters. People may also become infected by eating shellfish contaminated with viruses and other microorganisms contained in sewage discharge.

In 1988, the Interstate Shellfish Sanitation Conference developed specifications for states to use in determining shellfish harvest buffer zones around marinas. This is based on the potential for release of untreated or inadequately treated sewage into receiving waters from boats in marina basins. The pathogen level associated with the untreated discharge from one boat may exceed that from thousands of people via a sewage treatment plant with secondary treatment. Therefore, Delaware is required to prohibit shellfish harvesting in the buffer zones established around marinas. However, the size of these no-harvest zones can be significantly reduced around clean marinas that implement Best Management Practices designed to reduce the potential for the discharge of sewage into receiving waters. Compliance is measured under the auspices of an annual inspection by the U.S. Food and Drug Administration. Minimizing the size of the shellfish harvest buffer zones where no commercial or recreational shellfishing can occur is certainly a desirable goal.



Sewage is also harmful to water quality. Because the microorganisms within sewage need oxygen, any effluent discharged to waterways reduces the amount of oxygen available to fish and other forms of aquatic life. Furthermore, the heavy nutrient load in sewage promotes excessive algal growth. As the algae multiply, they prevent life-giving sunlight from reaching subsurface vegetation. When the algae die they create another problem: the algae are decomposed by bacteria which further reduce levels of dissolved oxygen.

## Legal Setting

### Marina Regulations

Delaware Marina Regulations require marinas to prepare and maintain a Sewage Spill Prevention and Containment Plan as part of their Operations and Maintenance (O&M) Plan.

### Marine Sanitation Devices

For all of the reasons stated above, it is illegal to discharge raw sewage from a vessel within U.S. territorial waters, i.e., anywhere other than three or more miles out into the open ocean. The Federal Clean Water Act requires that any vessel with an installed toilet be equipped with a certified Type I, Type II, or Type III marine sanitation device (MSD):

- *Type I* systems mechanically cut solids, disinfect the waste with a chemical additive or with chlorine disassociated from saltwater with an electronic jolt, and discharge the treated sewage overboard. The fecal coliform bacteria count of the effluent may be no greater than 1,000 per 100 milliliters and may not contain any floating solids.
- *Type II* systems are similar to Type I systems except that the Type II's treat the sewage to a higher standard; effluent fecal coliform bacteria levels may not exceed 200 per 100 milliliters and total suspended solids may not be greater than 150 milligrams per liter. Type IIs also require more space and have greater operating energy requirements.
- *Type III* systems do not allow sewage to be discharged. The most common form of a Type III system is a holding tank. Other forms include recirculating and incinerating systems. Under Delaware law, portable toilets are also included as Type III systems.

Vessels 65 feet and under may have any of the three types of MSDs. Vessels over 65 feet must have a Type II or III system. Additionally, Type I and Type II systems must display a certification label affixed by the manufacturer. A certification label is not required on Type III systems.

Remember, MSD requirements do not apply to vessels with portable toilets. Portable toilets should be properly emptied on shore. It is illegal to discharge raw sewage to any State waterway. Most pumpout facilities have wand attachments to empty portable toilets. Some marinas have portable toilet dump stations.

## Pumpout Stations

- ◆ Delaware law (Title 7, Del. C., Chapter 60 § 6035) requires that marinas located on tidal waters of the State, and that provide dockage for vessels with Type III marine sanitation device(s) (MSD), including portable toilet(s), to provide convenient access to an approved, fully operable and well maintained pumpout facility(ies) and/or dump station(s) for the removal of sewage from such vessels to an approved sewage disposal system.
- ◆ Owners/operators may agree to pool resources for a single pumpout or dump station with Departmental approval based on criteria of number and class of vessels, type of MSD aboard, marina locations, cost per pumpout use, and ultimate method of sewage treatment and disposal (i.e. septic system or waste water treatment facility). Note: If you expect to rely on another marina's pumpout facility for your slip renters, you **MUST** get prior approval from DNREC, AND you must obtain a letter from the other facility agreeing to the practice.
- ◆ The owner/operator of any boat docking facility that is located in whole or in part on tidal waters of the State, and that provides dockage for a live-aboard vessel(s) with a Type III marine sanitation device(s), shall install and maintain at all times, in a fully operable condition, an approved dedicated pumpout facility at each live-aboard vessel slip for the purpose of removing sewage from the live-aboard vessel on a
- ◆ Any discharge, by any means, of untreated or inadequately treated vessel sewage into or upon the waters of any marina, boat docking facility or tidal water of the State is prohibited.



*While not required, it is a good idea to include information about the MSD law in your contracts for slips, transients, and liveaboards too. You should also collect information in your slip contract about the presences and type of MSD aboard each vessel. This will allow you to determine whether you are legally required to provide access to a sewage pumpout facility for your marina patrons.*



*Delaware frequently has grant funding to help marinas cover the cost of installing pumpout systems. Inquire with Clean Marina Program staff to determine if and when money may be available.*

continuous or automatic, intermittent basis to a Department approved sewage disposal system.

- ◆ All vessels while on waters of the State shall comply with Federal marine sanitation device (MSD) regulations [33 U.S.C. § 1322, as amended February 4, 1987.]

Installation of a pumpout system may also be required as a condition of receiving a Marina Construction Permit or a Subaqueous Lands Permit from the Delaware Department of Natural Resources and Environmental Control.

## No Discharge Zones

A No Discharge Zone (NDZ) is an area of water that requires greater environmental protection and where even treated sewage may not be discharged from a boat. When operating in an NDZ, Type I and Type II systems must be secured to prevent discharge. All freshwater lakes, reservoirs, and rivers not capable of interstate vessel traffic are defined by the Federal Clean Water Act as No Discharge Zones. States, with the approval of the U.S. Environmental Protection Agency (EPA), may establish NDZ's in other State waters. Delaware would like to petition EPA to create a NDZ in the Delaware Inland Bays region once there are enough pumpout stations, and other federal requirements can be met.

## Best Management Practices to Control Sewage

**Install a Pumpout System.** Help boaters to meet the requirements of the law by providing a convenient, reliable marine sewage disposal facility, i.e., a pumpout station. You, as a marina operator, may benefit from the installation of a pumpout in several ways. The presence of the pumpout facility promotes a public perception that you are environmentally responsible. More tangibly, the need for portable toilets and holding tanks to be pumped out regularly will draw a steady stream of customers to your dock. Each arriving vessel represents an opportunity to sell fuel, hardware, repair services, etc.

Grant funding to help defray the costs of installing a pumpout unit is frequently available. To check the status of funding availability or to apply for a Pumpout Station Grant, contact DNREC's Division of Fish and Wildlife at (302) 739-9910 or [Lynn.Herman@state.de.us](mailto:Lynn.Herman@state.de.us), or the University of Delaware Sea Grant at (302) 645-4268 or [dchapman@udel.edu](mailto:dchapman@udel.edu). Please be aware that the grants are strictly reimbursable. You must pay for the equipment and installation up front. DNREC will then reimburse you for pre-approved expenses, which in the past have amounted to as much as 75% of the pumpout equipment cost, including installation.

In exchange for grant funding, marina owners agree to maintain pumpout systems in operating condition for a minimum of 10 years and agree not to charge more than \$5 per pumpout. The pumpout system must be able to accept waste from portable toilets as well as from holding tanks and must be available to the general public during

reasonable business hours. Although most marinas choose to use grant funding, there is no requirement to do so.

Once you have decided to invest in a pumpout system, consider the following recommendations.

- ❖ **Select an Appropriate System.** Select a system that best meets the needs of your clients and that can move the expected volume of sewage over the required distance. Ask the manufacturer for a written assurance that their system will operate effectively given the specific conditions at your marina.

There are several types of pumpout systems available:

- systems permanently fixed to a dock,
- mobile systems mounted on a golf cart or hand truck,
- direct slipside connections, and
- pumpout boats

Please note that grant funding is not available for direct slipside connections as these types of systems generally are not available for public use. Also, grant funding for pumpout boats is available only to government agencies.

- ❖ **Choose an Accessible Location.** Consider where the pumpout will be placed (if you select a fixed system). It should easily accommodate the types of boats that frequent your marina. Fuel docks are often good locations. Try to locate the pumpout system such that a vessel being pumped out does not prevent another boat from fueling.
- ❖ **Dispose of Collected Waste.** The best option for disposing of the collected waste is to connect directly to a public sewer line. If sewer is not available in your area, you will need a holding tank or approved septic system. The contents of the tank must be pumped periodically and trucked to a treatment plant. Holding tank size and location is generally determined by the local health department.
- ❖ **Handle Collected Waste with Care.** For health reasons, workers should take precautions to avoid coming into direct contact with sewage. Workers should wear rubber gloves and respirators when maintaining or repairing MSDs or pumpout equipment.
- ❖ **Decide if the Pumpout will be Staffed.** It is a good idea to have an attendant operate the pumpout. Consider installing a buzzer or paging system so that boaters at the pumpout station can easily locate the attendant. If the station is unattended, be sure that clear instructions for use are posted.
- ❖ **Decide Whether a Fee Will be Charged.** If a fee is charged, how much will it be? Will tenants and liveaboards be charged? Or just transients? Remember, no more than \$5 may be charged if grant funds were accepted for the purchase and/or installation of the system. If the pumpout system is not regularly staffed, you will have to make arrangements to collect the fee.

*Be careful how you word your signs! Shortly after installing a pumpout system, a marina owner hung a large sign declaring the availability of his new facility. Over the course of the next week he noticed a significant drop in fuel sales. One evening he watched one of his regular customers head across the creek to a competitor fuel dock. The marina manager called out to ask why the boater was bypassing his marina. The boater gestured toward the sign hung over the dock shared by the pumpout system and the fuel pumps. It read, "Pump Out." The boater thought "pump out" meant that the fuel pumps were out of order. A better choice for signs might be "Pumpout Station", "Sewage Pumpout", or simply show the national pumpout symbol.*



*The national pumpout symbol is an easy way to advertise the availability of pumpout facilities.*

- ❖ *Post Signs.* Provide information about use and cost of the pumpout station, hours of operation, and where to call for service if the system is out of order. Also, post signs that are visible from the channel so that passing boaters are aware of the facility. If you do not have a pumpout system, post directions to the closest public pumpout.
- ❖ *Maintain the Pumpout System.* You should inspect the system regularly and keep a log of your observations. Contact the pumpout manufacturer for specific maintenance and winterization recommendations. During the boating season, test the efficiency of the pump weekly by measuring the length of time required for the system to empty a 5-gallon bucket of water. In order to quickly address any malfunctions, establish a maintenance agreement with a contractor qualified to service and repair pumpout facilities.
- ❖ *Do Not Allow Waste to Drain into Receiving Waters.* Do not allow rinse water or residual waste in the hoses to drain into receiving waters. Keep the pump running until it has been re-primed with clean water.
- ❖ *Educate Staff.* There have been several incidents in which boaters were told that the pumpout system was broken when in fact it was not. There are also rude dockhands and inconvenient procedures. If boaters are going to use the pumpout systems, the experience must be as pleasant and convenient as possible. As the manager of a marina with a pumpout, you are demonstrating your commitment to clean water. It is imperative that your staff exhibit this same level of care.

**Discourage Discharge from Type I and Type II MSDs at the Slip or Mooring.** Effluent from legal Type I and Type II systems contains nutrients and possibly toxic chemicals. It probably contains pathogens as well. While many pass-through systems are capable of treating sewage to much higher levels, recall that the standard for Type I systems is a fecal coliform bacteria count of 1,000 per 100 milliliters (ml). Delaware's shellfish harvest standard is 70 total coliform per 100 ml. Thus, discharges from Type I and Type II systems in crowded, protected areas- such as marinas- pose a real threat to human health and water quality. Adopt the following recommendations to discourage discharge within your facility.

- ❖ Prohibit discharge of head waste in your marina as a condition of your lease agreements.
- ❖ Post signs prohibiting the discharge of head waste and directing people to use shoreside restrooms.

### **Provide Shoreside Restrooms.**

The goal is to encourage boat owners to use shoreside bathrooms. For example, residential marinas or park facilities that can provide convenient access to other public bathrooms or to personal home bathrooms comply with this goal.

- ❖ Provide clean, functional restrooms to encourage people not to discharge sanitation waste while in port.
- ❖ Make restrooms available 24 hours a day.
- ❖ Install a security system on restroom doors so people will feel safe using them, particularly late at night.
- ❖ Provide air conditioned and heated restrooms.

**Design and Maintain Septic Systems to Protect Water Quality and Public Health.** If you have a septic system, be alert for signs of trouble: wet areas or standing water above the absorption field, toilets that run slowly or back up, and odor. Septic failures can contaminate drinking water and shellfish. The following tips will help you to avoid the health risks and nuisance associated with an overburdened system (Miller and Eubanks 1992).

- ❖ Post signs in the laundry room encouraging patrons to use minimal amounts of detergents and bleaches.
- ❖ Do not dump solvents such as paint thinner or pesticides down the drain and post signs prohibiting customers from doing the same.
- ❖ Do not pour fats and oils down drains.
- ❖ Do not use a garbage disposal. Disposals increase the amount of solids entering the system. Capacity is reached more quickly. As a result, more frequent pumping is necessary.
- ❖ Use small amounts of drain cleaners, household cleaners, and other similar products.
- ❖ Do not use "starter enzyme" or yeast. These products can damage the system by causing the infiltration bed to become clogged with solids that have been flushed from the septic tank.
- ❖ Direct downspouts and runoff away from the septic field in order to avoid saturating the area with excess water. For stormwater management reasons, do not direct the flow toward paved areas.
- ❖ Do not compact the soil by driving or parking over the infiltration area.
- ❖ Hire a licensed professional to pump the tank every 2-5 years.

**Provide Facilities for Liveaboards.** Boaters who make their homes aboard vessels pose a tricky problem. It is not reasonable to expect that they will regularly untie in order to use a fixed pumpout facility. It is also unwise to assume that people living on their boats will always use shoreside restrooms. Furthermore, it is undesirable to allow a resident population to discharge Type I or II systems. Your obligation as marina owner/manager is to provide a convenient sewage disposal system for liveaboards while maintaining good water quality. Consider the following options to meet this challenge. Keep in mind that some liveaboards expect and are willing to pay a premium for extra service and more convenient slips.



*Sewage and gray water from bathhouses and laundry facilities may be discharged to a publicly owned treatment works or to an approved septic system.*



## Information Sources

American Boat and Yacht Council (ABYC)  
(410) 956-1050

### Appendix I

Delaware Department of Natural Resources and Environmental Control

- Nonpoint Source Program  
(302) 739-9922
- Division of Fish and Wildlife  
(302) 739-9910

- ❖ Provide a portable pumpout system or require that liveaboards contract with a mobile pumpout service.
- ❖ Reserve slips closest to shoreside restrooms for liveaboards. Be sure that the dock and route to the bathhouse are well lit at night.
- ❖ Stipulate in the lease agreement that vessels used as homes may not discharge any sewage.
- ❖ Offer to board their vessels and demonstrate the proper way to secure the "Y" valve.
- ✧ As a condition of the lease agreement, require that liveaboards place dye tablets in holding tanks to make any discharge clearly visible.
- ✧ Install direct sewer hookups for liveaboards.

### Offer MSD Inspections.

- ✧ Service patrons' MSDs annually to ensure that their Type I and II systems are functioning properly.
- ✧ Encourage boaters to run dye tablets through their Type I or Type II systems outside of the marina. If a system is operating properly, no dye will be visible. Maintenance is required if dye can be seen in the discharge.

### Encourage Compliance.

- ❖ Include information about MSD requirements and sewage laws in contracts for slips rentals, transients, and liveaboards.
- ❖ State that failure to comply with the MSD laws and marina policy will result in expulsion from the marina and forfeiture of fees.
- ❖ If a customer fails to observe the law or honor your contract: 1) discuss the matter with him or her, 2) mail a written notice asking that the offending practice stop immediately and keep a copy for your records, and 3) evict the boater.
- ❖ If a tenant is discharging raw sewage, report him or her to the Delaware Department of Natural Resources and Environmental Control (DNREC). Provide as much information as possible: name of owner, vessel, location, etc.

**Educate Boaters.** As the generators and conveyors of sewage, boaters need to be educated about the impacts of sewage and its proper disposal. They must also be encouraged to properly maintain their MSDs and to purchase environmentally friendly treatment products for their heads and holding tanks.

- ❖ Photocopy the *Clean Boating Tip Sheet* from the back of this Guidebook (after Chapter 11) and distribute it to your tenants. There is room to add your marina's name and logo.